

# **WATER DAMAGE ASSESSMENT**

**Massachusetts Gaming Commission  
101 Federal Street, 12<sup>th</sup> floor  
Boston, Massachusetts**



Prepared by:  
Massachusetts Department of Public Health  
Bureau of Environmental Health  
Indoor Air Quality Program  
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## Background

<b>Building:</b>	Massachusetts Gaming Commission (GC)
<b>Address:</b>	101 Federal Street, 12 <sup>th</sup> floor, Boston
<b>Assessment Requested by:</b>	Janice Reilly, GC
<b>Reason for Request:</b>	Water damage following a flood
<b>Date of Assessment:</b>	July 24, 2019
<b>Massachusetts Department of Public Health/Bureau of Environmental Health (MDPH/BEH) Staff Conducting Assessment:</b>	Mike Feeney, Director, IAQ Program and Ruth Alfasso, Environmental Engineer/Inspector, IAQ Program
<b>Building Description:</b>	Other office tenants occupy other floors in the building.
<b>Windows:</b>	Not openable

## Introduction

Over the weekend of July 20, 2019, water service to the building at 101 Federal Street was interrupted due to City of Boston work on the water mains. Building facility staff was not made aware of this interruption. As a result, adjustments to the building cooling system were not made and the system was not monitored. High outdoor temperatures led to overwork of the building cooling system without access to a source of water for cooling. This resulted in a release of water from the cooling system on the 15<sup>th</sup> floor of the building on Saturday July 20. Water flowed down and moistened materials on most floors of the building. Because of the location of the GC on the 12<sup>th</sup> floor, materials in this office were significantly impacted by the flood.

Note that the Cannabis Control Commission offices are located on the 13<sup>th</sup> floor of this building and were visited on July 22, 2019. Discussion of that visit is found in a separate report.

Reportedly, building facility staff became aware of the water release during the July 20, 2019 weekend, and began drying and other remediation measures.. These included:

- Use of fans to accelerate drying of carpeting and gypsum wallboard (GW);
- Removal of areas of GW, with holes drilled in some remaining wallboard to accelerate drying (Picture 1);
- Removal of coving from impacted walls (Picture 2)

- Movement of objects from the floor such as cabinets and floor mats;
- Measurement of moisture content of GW and carpeting to identify areas needing additional treatment.

## Methods

Please refer to the IAQ Manual for methods, sampling procedures, and interpretation of results (MDPH, 2015). In addition, visual observations were made of water-damaged materials, drying procedures being used, and other conditions that may impact IAQ. Some moisture measurements in GW and carpeting were conducted as is discussed further below.

## Results and Discussion

The following is a summary of indoor air testing results (Table 1).

- ***Carbon dioxide levels*** were above the MDPH guideline of 800 parts per million (ppm) in all areas tested, indicating that more fresh air is needed in the areas assessed.
- ***Temperature*** was within the MDPH recommended range of 70°F to 78°F in all areas.
- ***Relative humidity*** was within the MDPH recommended range of 40% to 60% in all areas assessed.
- ***Dew Point*** ranged from 47°F to 49°F indicating that condensation on surfaces would be unlikely at the time of the assessment.

### Ventilation

A heating, ventilating and air conditioning (HVAC) system has several functions. First it provides heating and, if equipped, cooling. Second, it is a source of fresh air. Finally, an HVAC system will dilute and remove normally-occurring indoor environmental pollutants by not only introducing fresh air, but by filtering the airstream and ejecting stale air to the outdoors via exhaust ventilation. Even if an HVAC system is operating as designed, point sources of respiratory irritation may exist and cause symptoms in sensitive individuals.

Fresh air is provided by ceiling-mounted fresh air diffusers. A mechanical exhaust vent system removes stale air. Fan coil units (FCU) were installed along exterior walls within the

building. The FCUs are designed to provide both heat and cooling. Depending on the setting, heated or chilled water is pumped through a finned tube (i.e., a coil) that is connected to the furnace/chiller by copper pipes that are installed in the pipe chase. Water runs through supply pipes into the coils, which heat/cool the air forced through the coils by the FCU fans. It is important to note that FCUs are designed to provide either heating or cooling, but do not have a fresh air supply. FCU units can only recirculate air.

To maximize air exchange, the MDPH recommends that both supply and exhaust ventilation operate continuously during periods of occupancy. In order to have proper ventilation with a mechanical supply and exhaust system, the systems must be balanced to provide an adequate amount of fresh air to the interior of a room while removing stale air from the room. It is recommended that HVAC systems be re-balanced every five years to ensure adequate air systems function (SMACNA, 1994). It is unknown when the last time this system was balanced.

### **Microbial/Moisture Concerns**

The following was observed during the visit:

- Wallboard was removed and had holes cut in its base to allow for drying in the affected areas (Picture 1). Coving was also removed from most affected walls (Picture 2).
- Moisture measurements were conducted in the remaining walls in the impacted area and many were found to still be moistened up to two feet above the floor.
- Damage was observed to fan coil unit housing covers, which appear to be made of plywood with a heavy layer of paint (Picture 3). Additionally, some were still wet at the time of the visit as shown by moisture measurements. These pieces should be replaced since water-damaged plywood can be an ongoing source of odors, particularly if it is in the airstream of air circulation equipment.
- Furniture and items including porous items (e.g., boxes) were observed remaining on the floor in the affected area (Pictures 2 and 4). Some of the boxes appeared water-damaged. These items can prevent walls/floors from drying and can prevent access for cleaning and testing. Furthermore, porous items can become colonized with mold.

The US Environmental Protection Agency (US EPA) and the American Conference of Governmental Industrial Hygienists (ACGIH) recommends that porous materials (e.g., wallboard, carpeting) be dried with fans and heating within 24 to 48 hours of becoming wet (US EPA, 2008; ACGIH, 1989). If porous materials are not dried within this time frame, mold growth may occur.

## **Conclusions/Recommendations**

1. Move or remove any items and furniture from the floor and away from walls in the affected areas to inspect underneath and behind them for additional water damage.
2. Water-damaged porous materials such as boxes/papers, laminated tables or other items may need to be discarded if they show signs of mold colonization such as musty odors.
3. Continue drying and remediating the affected area in accordance with the EPA guideline “Mold Remediation in Schools and Commercial Buildings” (US EPA, 2008). This may include:
  - a. Inspecting and cleaning the area above moistened ceiling tiles;
  - b. Cutting out and replacing areas of GW that continue to be moistened 48 hours after the flood;
  - c. Replacing the covers of all damaged fan coil units such as the one shown in Picture 2. All of these units should be inspected for odors and vacuumed of debris at this time as well.
  - d. Replacement of any carpet squares that had been moistened for over 48 hours or have any musty or moldy odors.
4. Activities that may be disruptive or lead to dust and odors should be conducted during off-hours (evenings and weekends) to the greatest extent practical.
5. Remove or separate staff from areas under remediation or construction to prevent exposure to dust and odors. Plastic sheeting and tape may be used for containment where needed.
6. Increase cleaning in the affected areas to remove dust and debris from carpeting and flat surfaces. Clean carpeting and surfaces thoroughly once the rest of the remediation is completed.

7. Ensure the ventilation system is operating continuously during occupied periods. This includes setting thermostats to “fan on” to ensure fresh air circulation occurs even when temperature settings are satisfied.
8. Consider adopting a balancing schedule of every 5 years for all mechanical ventilation systems, as recommended by ventilation industrial standards (SMACNA, 1994).
9. Refer to resource manual and other related IAQ documents located on the MDPH’s website for further building-wide evaluations and advice on maintaining public buildings. These documents are available at: <http://mass.gov/dph/iaq>.

## References

ACGIH. 1989. Guidelines for the Assessment of Bioaerosols in the Indoor Environment. American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

MDPH. 2015. Massachusetts Department of Public Health. Indoor Air Quality Manual: Chapters I-III. Available at: <http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/exposure-topics/iaq/iaq-manual/>.

SMACNA. 1994. HVAC Systems Commissioning Manual. 1<sup>st</sup> ed. Sheet Metal and Air Conditioning Contractors' National Association, Inc., Chantilly, VA.

US EPA. 2008. "Mold Remediation in Schools and Commercial Buildings". Office of Air and Radiation, Indoor Environments Division, Washington, DC. EPA 402-K-01-001. September 2008. Available at: <http://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide>.

**Picture 1**



**Gypsum wallboard cut away from wall with holes drilled in opposite side**

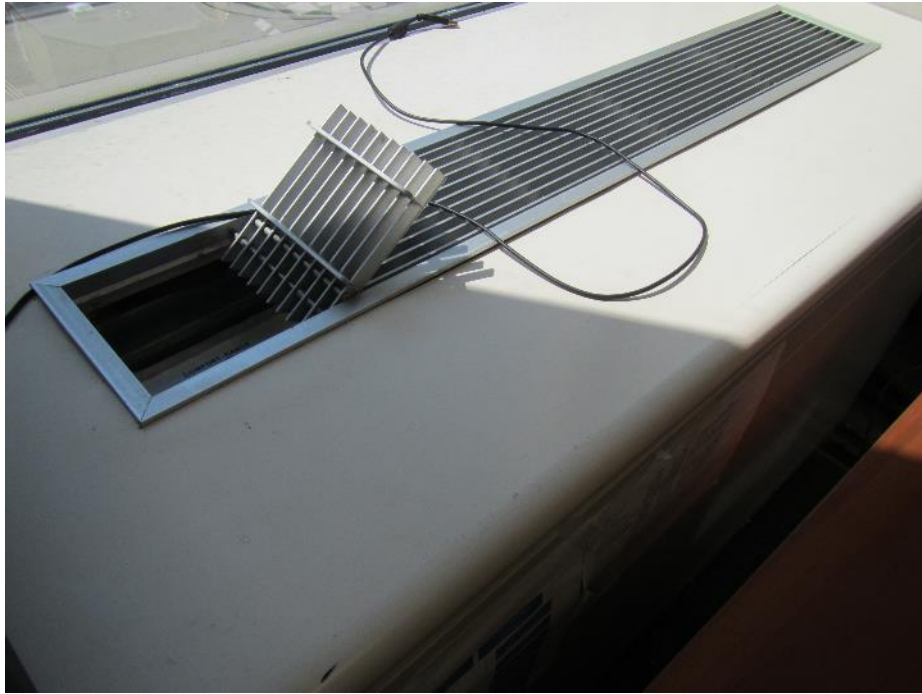
**Picture 2**



**Coving removed from wall, note furniture against wall**



**Picture 3**



**Fan coil unit cover, found to be moist**

**Picture 4**



**Box on floor in impacted area, note signs of water damage**